

LXVII.—*Some new Forms of American Rotifera.*—II.

By Dr. ALFRED C. STOKES.

[Plate XIV.]

THE following presumably undescribed Rotifera were all taken from a shallow clear-water pool in a rocky wood near Trenton, New Jersey, U.S.A.

Notommata vorax, sp. n. (Pl. XIV. figs. 1-3.)

Elongate, subcylindrical, exceedingly soft, flexible, and changeable; ventral surface flattened; integument often thrown into numerous irregularly longitudinal folds; front rounded, but exhibiting in side view a short curved proboscis similar to that of *Taphrocampa*, and visible in dorsal or in ventral aspect as a narrowly semicircular appendage; body somewhat tapering posteriorly; tail represented by a short inconspicuous semicircular projection; foot short, oblong, changeable; toes short, robust, conical, excentrically acuminate; cilia entirely prone; auricles conspicuous, subcylindrical, surrounded by a hyaline subspherical membrane bearing the long cilia; dorsal antenna a single minute setigerous fossa; lateral antennæ not observed; brain large, extending to or beyond the mastax, the posterior extremity opaque, a single red eye placed at the front of the granular mass; trophi forcipate, protrusible; œsophagus long, conspicuous, irregularly annulate, or sometimes apparently twisted and cord-like; gastric glands present, multinucleate; stomach and intestine not differentiated from each other; ovary ventrad to the intestine; contractile vesicle subspherical, near the posterior extremity; foot-glands two, but apparently accompanied by two or more smaller glands; movements vermicular, except when swimming by the aid of the auricles, when the motion is often rotary on the longitudinal axis; posterior body-region imperfectly retractile, the toes not being withdrawn entirely into the body.

Length about $\frac{1}{100}$ inch.

Habitat as mentioned at the head of this paper, as is that of all the following forms.

This seems to be a delicate creature, but its voracious appetite is amusing. I have noted several specimens with the intestinal canal distended by a long unbroken filament of alga (*Oscillatoria*) bent upon itself and in the process of digestion. In a single instance I have observed a similar

thread of *Oscillatoria* by the Rotiferon's deliberate forward movement thrust through the mastax, the œsophagus, and the rest of the alimentary canal, until it impinged upon the posterior intestinal wall, where the resisting pressure turned the alga upon itself, when the upper free end slipped into the stomach.

This Rotiferon is, in my opinion, not a *Notommata*, but I place it in that genus for present convenience; neither do I think that *Taphrocampa clavigera*, mihi*, is a member of that genus, in which I have placed it for the same reason. When our American Rotifera are monographed in the future, a new genus will probably be needed to receive both these forms, with *Taphrocampa clavigera* as the type. There are others in our American waters closely allied to these, and sufficiently distinct to merit specific rank, but agreeing neither with *Taphrocampa* nor with *Notommata* as at present diagnosed, yet resembling both in some features, as do the two forms here mentioned.

Proales hyalina, sp. n. (Pl. XIV. fig. 4.)

Irregularly obconical, entirely transparent; dorsum arched, the ventrum somewhat flattened, the pectoral region beneath the mastax forming a conspicuous rounded projection; corona obliquely transverse and prone; coronal cilia of two kinds, those of the pectoral region large, long, vigorous, and apparently limited to a single series, the others shorter, fine, and delicate; dorsal antenna single, with but few long stout setæ; lateral antennæ conspicuous, each with one or two long stout setæ and several smaller radiating hairs; foot long, stout, tapering to the two short acute conical toes; brain irregular, not large, apparently suspended by several anterior nervous prolongations, and by the large nerves to the antennæ; eye single, red; mastax large, surrounded anteriorly by a collection of small subspherical bodies, apparently forming a glandular mass; two or more small pyriform salivary glands attached posteriorly to the mastax near the origin of the long strongly ciliated œsophagus; gastric glands subspherical, at the frontal shoulder of the stomach, which, with the intestine, is lobulated, especially when empty; anal orifice in a conspicuous dorsal projection; ovary ventrad to the stomach and the intestine; contractile vesicle small, ventrad to the intestine; lateral canals and the flame-cells chiefly limited to the ventral region, only a single flame-cell having been observed elsewhere, this being above the mastax;

* Ann. & Mag. Nat. Hist., July 1896.

foot-glands large, elongate-ovate; muscle-bands slender, conspicuous, numerous.

Length about $\frac{1}{100}$ inch.

Movements rapid.

My artistic skill is not great enough to enable me to draw this creature so as to give any idea of its crystalline transparency and brilliancy. The figure, therefore, is little more than a diagram to present the Rotiferon's contour as accurately as possible, with some indication of the position and proportionate size of the internal organs. A professional artist of great skill would be needed to do more.

Diglena contorta, sp. n. (Pl. XIV. fig. 5.)

Body elongate-subcylindrical, gibbous posteriorly, the front usually neck-like, the entire animal capable of considerable elongation and narrowing, when the gibbous region becomes flattened; front rounded, usually convex, bearing a small hook-like proboscis, beneath which the frontal border is conspicuously emarginate; ventrum flattened; dorsum rounded, suddenly but evenly depressed posteriorly, thence continued as a subcylindrical prolongation, the termination of which overhangs and almost completely surrounds the short rounded foot which projects from it as a small subglobose papilla; toes two, small, short, conical, divergent; cilia fine, short, numerous, filling a narrow elongate-obovate field, entirely prone and about one third the length of the animal; auricles present, small, apparently represented when retracted by a flabelliform or irregularly oval and conspicuously ciliated region on each lateral border of the head, although it is difficult to determine positively whence the organs are protruded, as the Rotiferon's movements are then rapid and erratic; dorsal antennæ two; lateral antennæ two; eyes not observed; brain large, long, saccate, extending from the front for about one third the entire length of the body, a small cluster of dark granules near the tip; mastax large, elongate-ovate, beneath the brain and extending scarcely beyond its tip; trophi weak, apparently forcipate; gastric glands immediately behind the mastax; stomach and intestine ciliated, not differentiated from each other except by the presence within the stomach and immediately next to the walls of a crowded layer-like mass of dark-bordered granules, sometimes grouped into distinctly polygonal areas, and often so numerous that they obscure all the rest of the internal anatomy; intestine comparatively thin-walled and without the conspicuous granules of the stomach-walls; ovary poste-

riorly placed, ventrad to the stomach and intestine; foot-glands long; lateral canals and flame-cells numerous, but apparently without contractile vesicle; movements rapidly swimming by means of the auricles or writhing with indescribable contortions.

Length about $\frac{1}{150}$ inch.

Mastigocerca spinigera, sp. n. (Pl. XIV. fig. 6.)

Lorica in lateral aspect hemispherical, somewhat depressed, ventrum flattened; frontal border somewhat excavate transversely, elastic and contractile; dorsum not crested, but anteriorly flattened, the lateral borders of the lorica being somewhat compressed and slightly concave, the dorsum thus showing on each side a slight posteriorly convergent ridge; foot single-jointed; toe exceeding the lorica in length, tapering to a finely acuminate termination; accessory basal stylets small, from four to six in number, voluntarily and separately movable; dorsal antenna prominent, located on the flattened region about one third the length of the lorica from the frontal border, the setæ few (apparently only two), stout and seemingly fleshy; each lateral antenna at the base and in front of a stout, slightly curved, acuminate thorn-like process; eye single, red, at the extremity of a saccate lobe of the large brain; occipital region of the front bearing a conspicuous subcylindrical proboscis-like organ, which is flexible and movable.

Length of the lorica, including foot, $\frac{1}{205}$ inch; height (depth) of lorica $\frac{1}{320}$ inch; length of toe $\frac{1}{140}$ inch.

This form is remarkable for the apparently fleshy setæ of the dorsal antenna and for their fewness; but it is chiefly notable for the peculiar and characteristic thorn-like processes which accompany and perhaps form a part of the lateral setigerous antennæ. The short apically concave antennæ are so close to these thorns or so intimately connected with them that they cannot be optically separated.

The internal structure calls for no special mention.

Cathypna scutaria, sp. n. (Pl. XIV. fig. 7.)

Lorica broadly elliptical in outline, punctate; frontal borders excavate, the pectoral more deeply so than the dorsal; fronto-lateral apices subacute; posterior region much depressed and continued as a conspicuous, somewhat dorsally curved, shield-like projection dorsad to the foot and covering it, the posterior border concave, the postero-lateral terminations obtusely pointed; dorsal antenna single, apparently a small setigerous

pit; lateral antennæ small, on the ventral aspect of the lateral inangulation, and almost concealed within the sulcus; frontal and lateral borders of the head bearing a hyaline, flexible, collar-like membrane or hood, folded together and withdrawn into the lorica during the retraction of the animal; brain large, obscurely three-lobed posteriorly; eye single, red, sub-centrally placed on the nerve-ganglion; gastric glands retort-shaped; stomach bearing internally an undulating membraniform appendage, which is in reality a tubular prolongation similar to that of *Floscularia*, *Apsilus*, and others; foot short, single-jointed, about as broad as long; toes rod-like, about as long as the greatest width of the lorica, each one-shouldered and with a minute seta on the shoulder; claws acuminate, about one sixth the length of the toe.

Total length, including toe, 0.015 inch; width of lorica and length of toes without foot 0.006 inch.

Cathypna glandulosa, sp. n. (Pl. XIV. figs. 8-10.)

Rotiferon large and robust; lorica finely punctate; frontal borders almost even, the pectoral somewhat excavate between the lateral pointed apices; prolonged posteriorly as a broad, rounded, evenly convex region; toes long, rod-like, irregularly constricted in front of the rectangular shoulder, each of which bears a minute seta; claws about one third the length of the toes, tapering to an acute point; brain large, not lobed posteriorly; eye single, red, placed on the lower surface of the nerve-ganglion, so that the light must pass to it from above through the entire thickness of the ganglionic mass; gastric glands long, retort-shaped; stomach bearing internally an undulating apparently membraniform appendage, in reality a long broad tube continuous with the œsophagus; stomach and intestine usually in constant movement; ovary small when not functionally active, placed ventrad to the intestine and on the left-hand side; contractile vesicle large, transversely placed in the median line near the posterior border, the lateral canals plainly connected with it on each side; flame-cells flabelliform; foot-glands six, geminate, the three groups varying greatly in size and form; lateral antennæ not observed; dorsal antenna single, apparently a circular depression furnished with long setæ and placed at the gap of a central obconical incision in the hyaline hood, which covers it during retraction.

Length of lorica $\frac{1}{75}$, width $\frac{1}{100}$ inch; length of toes $\frac{1}{168}$ inch.

The Rotiferon is remarkable for its large size and robust character, but chiefly for the apparently superabundance of

its foot-glands. These are six geminate multinucleate bodies, arranged according to size and form as shown by fig. 10. The two in the median line are the smallest and exhibit the most characteristic form, being elongate-obovate, with somewhat flattened internal faces and long narrow ducts. Those of the second group are larger, elongate-obpyriform, and have almost horizontal irregularly sinuous ducts; while the third pair are robust, elongate-subcylindrical, and often variously curved or lobed. The ducts of all seem to meet to form a single common conduit; but they are so soon lost within the mass of foot-muscles, that it has not been possible to decide this point positively with my specimens.

EXPLANATION OF PLATE XIV.

- Fig. 1. *Notommata vorax*.
 Fig. 2. Ditto. Auricle.
 Fig. 3. Ditto. Toes.
 Fig. 4. *Proales hyalina*.
 Fig. 5. *Diglena contorta*.
 Fig. 6. *Mastigocerca spinigera*.
 Fig. 7. *Cathypna scutaria*.
 Fig. 8. *Cathypna glandulosa*; dorsal.
 Fig. 9. Ditto; ventral.
 Fig. 10. Ditto. The geminate foot-glands.

LXVIII.—*Descriptions of Eleven new Species of Land and Freshwater Mollusca from South Africa.* By JAMES COSMO MELVILL, M.A., F.L.S., and JOHN HENRY PONSONBY, F.Z.S.

[Plate XVII.]

WE consider that several of the Mollusca now to be described possess a peculiar interest, notably the *Achatinae*, one of which has remained long unrecognized, though collected years ago in Bechuanaland by Dr. Livingstone; whilst the other, a remarkably conspicuous though variable form, inhabits the Drakensberg range of mountains. The discovery of a *Hapalus* so far south in the African continent is likewise important, whilst new forms of the attractive genus *Ennea* still continue to come to the front, no one species exhibiting much, if any, variability*.

* See Ann. & Mag. Nat. Hist. ser. 6, vol. xviii. p. 314.